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<b>Volumetric Measuring Devices</b>	Issued: <b>2004-03-01</b>	Revision Number: <b>Original</b>	

## **SPECIALISED TEST PROCEDURES - BOTTOM FILL AIR ENTRAPMENT (CALIBRATED TANKS)**

### **APPLICATION**

This procedure is performed on calibrated tanks that are equipped with bottom fill stubs.

### **PURPOSE**

Bottom fill stubs on trucks are normally designed with a slope to allow air to flow upward and escape through the tank vent. On occasion the slope is slight and this test will determine if any air that may be trapped exceeds allowable limits.

**LEGISLATIVE REFERENCES:** R.316.

### **PROCEDURE**

There are two methods to determine the quantity of air that may be trapped in the stub: by calculation (approximative) or by testing (exact).

#### **BY CALCULATION (APPROXIMATE)**

Mathematically compute the approximate volume of the portion of piping that may be trapping air using the following formula:  $V = \pi r^2L$ , where r is the inside radius of pipe and L is the length of the pipe.

**NOTE:** This method determines the total volume of the suspect pipe and because the pipe will generally be partly filled with product, the calculation will result in higher values than an actual test.

No need to proceed further if the calculation clearly demonstrate that no air can be trapped in an amount exceeding the tolerances. In case of doubt or when the calculation demonstrate that the tolerances are exceeded, proceed further with the following test.

#### **BY TESTING (EXACT)**

Top fill the tank to its lowest capacity indicator. With a suitable container under the stub, open it slightly to remove any trapped air.

**CAUTION:** A large volume of product may exit during this procedure.

Return any product to the compartment.

The amount of additional product required to refill the compartment to its lowest capacity indicator is equivalent to the amount of air trapped in the stub.

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### **INTERPRETATION OF RESULTS**

**NOTE:** Any enforcement action must be taken on the actual error as found by the second method.  
The calculated quantity should only be used to determine if further testing is required.

A bottom loading stub must not trap an amount of air that exceed 0.125 per cent of the capacity of the tank to the lowest marker, otherwise the tank must be dry line calibrated for top-fill only; or wet line calibrated for bottom fill only.

### **REVISION**

Original document